

CLAIMS

1. A method for inputting a request to a hand-held device, transmitting a server request corresponding to the input request from the hand-held device to a server computer through a telecommunications link, receiving a response to the server request by the hand-held device from the server computer, and outputting the response by the hand-held device, the method comprising:

coupling the hand-held device to a telecommunications link to transmit the request and to receive the response through the telecommunications link;

inputting the request from an input medium to an input component of the hand-held device;

processing the input request to produce a corresponding server request;

transmitting the server request to the server computer;

receiving the response from the server computer through the telecommunications link; and

outputting the response via an output component.

2. The method of claim 1 wherein the input media is one of:

audio tones,

keypad input, and

extracting data encoded in one of

a mechanical medium,

a magnetic medium,

an electronic medium, and

a printed medium.

3. The method of claim 1 wherein the input media is a combination of two or more of input media selected from:

audio tones,

keypad input, and

extracting data encoded in one of

a mechanical medium,
a magnetic medium,
an electronic medium, and
a printed medium.

4. The method of claim 1 wherein the telecommunications link is one of:
 - a standard telephone line;
 - a cellular telephone;
 - a PBX telephone line;
 - a wireless telephone;
 - a personal communication system telephone;
 - a radio frequency connection;
 - a cordless telephone; and
 - an RS232 or universal serial bus to a computer that is, in turn, coupled to a remote server computer via a telecommunications link.
5. The method of claim 1 wherein the input request includes an access code.
6. The method of claim 5 wherein the access code is one of:
 - an IP address;
 - a URL;
 - a web site address;
 - a product/service ID code; and
 - a phone number.
7. The method of claim 1 further including storing the input request in non-volatile memory for communication via telecommunication link at a later time or date.
8. The method of claim 7 further including:
transmitting a request, previously stored in non-volatile memory, via a telecommunication link to a server.

9. The method of claim 1 wherein the hand-held device includes a smart card reader input component for inputting information encoded electronically in a smart card.
10. The method of claim 1 wherein the hand-held device includes a magnetic card reader input component for inputting information encoded magnetically on a magnetic card.
11. The method of claim 1 wherein the hand-held device includes a bar code reader input component for inputting information stored in a printed bar code.
12. The method of claim 11 wherein the bar code reader comprises a bank of illumination elements for illuminating a printed bar code, an optical element for gathering light reflected from the printed bar code, a charge coupled device for sensing bar codes from the gathered light, and a low-power proximity detector; and wherein, when activated, the bar code reader activates the low-power proximity detector to first detect a reflective surface within a threshold distance from the optical element prior to activating the illumination elements to read a bar code.
13. The method of claim 11 wherein the bar code reader comprises a laser bar code reader.
14. The method of claim 11 wherein the bar code reader comprises a LED bar code reader.
15. The method of claim 11 wherein the bar code reader comprises a CCD bar code reader.

16. The method of claim 1 wherein the hand-held device includes a telephone for person-to-person communication or person-to-computer computer server communication.
17. The method of claim 1 wherein the hand-held device includes a speaker output component for outputting audio information.
18. The method of claim 1 wherein the hand-held device includes a microphone input component for inputting an input request represented by audio tones.
19. The method of claim 1 wherein the hand-held device includes a keypad input component for inputting an input request represented by mechanical manipulation of the keypad.
20. The method of claim 1 wherein the hand-held device includes a visual display output component capable of displaying alphanumeric symbols.
21. The method of claim 1 wherein the hand-held device includes a visual display output component capable of displaying both alphanumeric symbols and graphical images.
22. The method of claim 1 wherein the hand-held device includes a printer output component.
23. The method of claim 1 wherein the hand-held device includes an input or output component comprising a serial interface element such as RS232.
24. A hand-held device for inputting request data, constructing a request, transmitting the request to a server computer through a telecommunications link, receiving a response to the request from the server computer, and outputting the response, the hand-held device coupled to a telecommunications link through which the request is transmitted and the response is received, the hand-held device comprising:

a number of input components for inputting request data from a number of different input media, including audio tones and mechanical manipulation of an input component and at least one of additional input media including electronic, magnetic, and printed request data;

a processing component that constructs a request from the request data;

a transceiver component that sends the request to the server computer and receives the response from the server computer; and

a number of output components that output a portion of the response received from the server computer in a particular response output medium.

25. The hand-held device of claim 24 including a microphone input component that inputs audio data, including voice data.

26. The hand-held device of claim 24 including a scanner input component that inputs printed images and characters.

27. The method of claim 24 wherein the hand-held device includes a keypad input component for inputting an input request represented by mechanical manipulation of the keypad.

28. The hand-held device of claim 24 including a magnetic card reader input component that inputs magnetically encoded data.

29. The hand-held device of claim 24 including an electronic smart card reader input component that inputs electronically encoded data.

30. The hand-held device of claim 24 including a printed bar code reader input component that inputs data represented by printed bar codes.

31. The hand-held device of claim 24 including an output component that outputs alphanumeric symbols.

32. The hand-held device of claim 24 including an output component that outputs alphanumeric symbols.
33. The hand-held device of claim 24 including an output component that outputs alphanumeric symbols and graphical images.
34. The hand-held device of claim 24 including an audio speaker output component.
35. The hand-held device of claim 24 including a printer output component.
36. The hand-held device of claim 24 wherein the processing component is a microprocessor and wherein the microprocessor runs a number of software routines that construct requests from input request data and that manage the activation and deactivation of components within the hand-held device in order to conserve electrical power consumption by the hand-held device.
37. The hand-held device of claim 36 wherein, under control of the software routines executed by the microprocessor, an input component is activated when input data is available for that input component and the input component is deactivated once data input is completed.
38. The hand-held device of claim 36 wherein, under control of the software routines executed by the microprocessor,
 - a transmission component of the transceiver is activated to send the request.
 - upon completion of sending the request, the transmission component is deactivated and a reception component of the transceiver is activated, and
 - upon completion of receiving the response, the reception component is deactivated.
39. The hand-held device of claim 36 wherein, under control of the software routines executed by the microprocessor, an output component is activated when output for that output

component is included in the response and is deactivated following completion of output of the response.

40. The hand-held device of claim 36 wherein the hand-held device includes a bar code reader and wherein a proximity detector within the bar code reader is used to ensure that a reflective surface that might contain a bar code is sufficiently close to the bar code reader before activating the bar code reader for reading a bar code.

41. The hand-held device of claim 40 wherein the microprocessor in the hand-held device is powered down while the proximity detector of the bar code reader is detecting the proximity of a reflective surface and wherein, and, once a bar code has been read, a bar code microprocessor within the bar code reader signals the microprocessor in the hand-held device to power up the microprocessor in the hand-held device in order to process the bar code.

42. The hand-held device of claim 40 wherein the bar code reader includes a bank of illumination elements that together illuminate a bar code to be read, and wherein the proximity detector comprises a subset of the illumination elements that provide sufficient illumination to detect a reflective surface.

43. The hand-held device of claim 40 wherein input components that receive amplified signals receive amplified signals from dual power mode amplifiers such that, when no signals are being input to the input components, the dual power mode amplifiers are in a low-power state in order to conserve consumption of electrical power by the hand-held device.

44. The hand-held device of claim 24 further including a protected memory that stores input information that must be protected from access by external devices and that is transmitted in an encrypted form from the hand-held device to the telecommunications link.

45. The hand-held device of claim 24 further including a tone generator output component that sends multiple frequency tones that do not occur in voice-generated analog signals that

serve as out-of-band signals to a receiving transceiver connected to the remote server computer.

46. The hand-held device of claim 45 wherein a multiple frequency tone is sent by the tone generator to interrupt analog communications being received from the remote server computer.

47. The hand-held device of claim 46 wherein multiple frequency tones are sent by the tone generator to initialize data exchange between the hand-held device and the remote server computer, including to set the baud rate, protocol, and other communications parameters prior to sending a request.

48. The hand-held device of claim 24 wherein the telecommunications link is a telephone line.

49. The hand-held device of claim 24 wherein the telecommunications link is an RS232 connection to a computer that is linked to the server computer.

50. The hand-held device of claim 49 wherein the hand-held device is also coupled to a telephone line and uses internal level shifting method, such as optical coupling, to enable drawing current from both the RS232 connection and the telephone line.

51. The hand-held device of claim 24 wherein the telecommunications link is a universal serial bus connection to a computer that is linked to the server computer.

52. The hand-held device of claim 51 wherein the hand-held device is also coupled to a telephone line and uses internal level shifting method, such as optical coupling, to enable drawing current from both the RS232 connection and the telephone line.

53. The hand-held device of claim 24 wherein the telecommunications link is a wireless telephone.

54. The hand-held device of claim 24 wherein the telecommunications link is a cellular telephone.
55. The hand-held device of claim 24 wherein the telecommunications link is a personal communications system telephone.
56. The hand-held device of claim 24 wherein the telecommunications link is a PBX telephone line.
57. The hand-held device of claim 24 wherein the transceiver component is included in a first unit and the input, output, and processing components are included in a second unit, wherein the first unit and second unit are coupled by communications via optical signals or radio frequency signals.
58. The hand-held device of claim 24 wherein the input component comprises a laser bar code reader.
59. The hand-held device of claim 24 wherein the input component comprises a LED bar code reader.
60. The hand-held device of claim 24 wherein the input component comprises a CCD bar code reader.
61. The hand-held device of claim 24 further including one or more energy storing devices selected from capacitors and batteries that obtain electrical power from the telecommunications link when the hand-held device is connected to the telecommunications link and that provide electrical power to the hand-held device when the hand-held device is not connected to the telecommunications link.

62. The hand-held device of claim 24 includes a telephone for person-to-person or person-to-computer server voice communications via telecommunication link.

63. The hand-held device of claim 24 wherein the input component comprises or output component comprises a serial interface such as RS232.

64. A method for electronically processing an access code included in an input medium, the method comprising:

inputting the access code to a hand-held device from the input medium;

processing the access code to produce a corresponding server access request;

coupling the hand-held device to a telecommunications link to transmit the access request to a server computer and to receive a response from the server computer through the telecommunications link:

transmitting the access request to the server computer;

receiving a response from the server computer through the telecommunications link;

and

outputting the response via an output component of the hand-held device.

65. The method of claim 64 wherein the input media is one of:

audio tones,

keypad input, and

data encoded in one of

a mechanical medium,

a magnetic medium,

an electronic medium, and

a printed medium.

66. The method of claim 64 wherein the input media is a combination of two or more of input media selected from:

audio tones;

keypad input, and

data encoded in one of

- a mechanical medium;
- a magnetic medium;
- an electronic medium;
- a serial interface, and
- a printed medium.

67. The method of claim 64 wherein the telecommunications link is one of:

- a standard telephone line;
- a cellular telephone;
- a PBX telephone line;
- a wireless telephone;
- a personal communication system telephone;
- a radio frequency connection;
- a cordless telephone; and
- an RS232 or universal serial bus to a computer that is, in turn, coupled to a remote server computer via a telecommunications link.

68. The method of claim 64 wherein the access code is one or more of:

- an IP address;
- a URL;
- a web site address;
- a product/service ID code; and
- a telephone number;

69. The method of claim 64 further including storing the input request in non-volatile memory for communication via telecommunication link at a later time or date.

70. The method of claim 64 further including:

- transmitting an access request, previously stored in non-volatile memory, via a telecommunication link to a server.

71. The method of claim 64 wherein the hand-held device includes a smart card reader input component for inputting access information encoded electronically in a smart card.
72. The method of claim 64 wherein the hand-held device includes a magnetic card reader input component for inputting access information encoded magnetically on a magnetic card.
73. The method of claim 64 wherein the hand-held device includes a bar code reader input component for inputting access information stored in a printed bar code.
74. The method of claim 64
wherein the input component comprises
 - a bank of illumination elements for illuminating a printed bar code.
 - an optical element for gathering light reflected from the printed bar code.
 - a charge coupled device for sensing bar codes from the gathered light, and
 - a low-power proximity detector; andwherein, when activated, the bar code reader activates the low-power proximity detector to first detect a reflective surface within a threshold distance from the optical element prior to activating the illumination elements to read a bar code.
75. The method of claim 64 wherein the bar code reader comprises a laser bar code reader.
76. The method of claim 64 wherein the bar code reader comprises a LED bar code reader.
77. The method of claim 64 wherein the input component comprises a CCD bar code reader.
78. The method of claim 64 wherein the hand-held device includes a microphone input component for inputting an input request represented by audio tones.

79. The method of claim 64 wherein the hand-held device includes a keypad input component for inputting an input request represented by mechanical manipulation of the keypad.
80. The method of claim 64 wherein the hand-held device includes a visual display output component capable of displaying alphanumeric symbols.
81. The method of claim 64 wherein the hand-held device includes a visual display output component capable of displaying both alphanumeric symbols and graphical images.
82. The method of claim 64 wherein the hand-held device includes a printer output component.
83. The method of claim 64 wherein the hand-held device includes an output component comprising one or more illumination element.
84. The method of claim 64 wherein the hand-held device includes an output component comprising a speaker element.
85. The method of claim 64 wherein the hand-held device includes a serial interface that is an output component.
86. The method of claim 64 wherein the hand-held device includes a serial interface that is an input component.